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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,381	11/12/2003	Moris Dovek	HT02-016	6373

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EXAMINER	
KAYRISH, MATTHEW	

ART UNIT	PAPER NUMBER
2627	

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10/30/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/706,381	DOVEK ET AL.	
	Examiner	Art Unit	
	MATTHEW G. KAYRISH	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *4-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claim 4 has been amended. Claims 4-10 remain pending.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/4/2008 has been entered.

Response to Arguments

3. Applicant's arguments to the objection of claim 4 and figure 4 have been considered and they are persuasive. Therefore the previous objection has been withdrawn.

Applicant's arguments, filed 8/4/2008, with respect to claim 4 have been considered but are moot in view of the new grounds of rejection.

Applicant contends that Stoev's first layer of high permeability material is not on the substrate, but is separated therefrom by intervening layers. This is not persuasive because the entire stack of layers of Stoev is disposed on the substrate. The first layer of high permeability is part of a stack that is disposed on the substrate, and thus, the

layer is disposed on the substrate. That this layer is not disposed directly on the substrate is not stated in claim 4 and thus, is irrelevant.

Applicant further contends that layers 210 and 220 of Stoev are not equivalent to layer 208 of the present invention because layers 210 and 220 do not fully cover the primary pole layer. This argument is persuasive, however is moot in view of the new grounds of rejection.

Applicant further contends that Stoev does not specifically disclose that layers 210 and 220 have high permeability. This argument is not persuasive because the pole tip layers are inherently of a high permeability material. These layers must have high permeability because the magnetic flux is concentrated at the tips for a strong recording signal.

Applicant further contends that it would be counter-productive for layer 210 to have high permeability similar to 220 since this would result in a track width increase equal to the thickness of layer 210. This is not persuasive because the track width is not in a thickness direction of the pole tip. The track width is in the direction "into the page" of figure 4, not in the thickness direction of item 210.

Applicant further contends that Stoev's upper pole is separated from ledge 220 by both secondary pole 68 as well as non-magnetic layer 45. The present invention claims only one layer 14 between ledge 41 and upper pole. This is not found persuasive because the claims do not specifically state that ONLY one layer is between the ledge and the upper pole.

For these reasons, claims 4-10 remain rejected in view of Stoev et al (US Patent Number 6724572) and Santini (US Patent Number 6557242), as presented below.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stoev et al (US Patent Number 6724572), in view of Santini (US Patent Number 6557242).

Regarding claim 4, Stoev discloses:

A magnetic write head, having an air bearing surface (ABS) (figure 4, item 33), comprising:

On a substrate (figure 4, item 28), a first layer of high magnetic permeability material (figure 4, item 208), having, on a first side, an edge whose surface is normal to said substrate and parallel to said ABS (figure 4), that serves as a primary lower magnetic pole (column 5, lines 32-43);

A first non-magnetic layer (figure 13/15, item 610, unlabeled in figure 4) that contacts said first layer of high magnetic permeability material only at said edge and

extends away therefrom (figure 15), said non-magnetic layer having a top surface that is coplanar with that of said primary lower magnetic pole (figure 15);

A second layer (figure 4, item 210 & 220) of high magnetic permeability that serves as a secondary lower pole (column 5, lines 32-43) that covers and contacts said primary lower magnetic pole and said first non-magnetic layer (figure 4), above which it serves as a ledge having a width (column 5, lines 32-43);

A field coil over (figure 4, item 118), and insulated from (figure 4, item 45), said primary and secondary lower poles (figure 4);

An upper magnetic pole (figure 4, item 72) that overlies said field coil (figure 4), contacting said lower pole at a second side that is opposite to said first side (figure 4, via item 60; column 3, lines 27-51), and that is separated from said ledge at said first side by a second layer of non-magnetic material that is a write gap (figure 4, item 4), said upper magnetic pole having, at the write gap, a width equal to said ledge width, whereby it defines a track width (column 1, lines 48-58 implies the poles define the track width);

Said ledge extending away from said primary pole by an amount (figure 4, items 212 & 214).

Stoev fails to specifically disclose:

A second layer of high magnetic permeability that serves as a secondary lower pole that fully covers said primary lower magnetic pole;

An upper magnetic pole, contacting said secondary lower pole at a second side that is opposite to said first side.

Santini discloses:

A magnetic write head, having an air bearing surface (ABS) (figure 22AD), comprising:

A first layer of high magnetic permeability material (figure 22AD, item P1B/S2), having, on a first side, an edge whose surface is normal to said substrate and parallel to said ABS (figure 22AD);

A second layer (figure 22AD, item P1T) of high magnetic permeability that serves as a secondary lower pole that fully covers and contacts said primary lower magnetic pole (figure 22AD);

A field coil over (figure 22AD, item 728), and insulated from (figure 22AD, via item 730), said primary and secondary lower poles (figure 22AD);

An upper magnetic pole (figure 22AD, item P2T) that overlies said field coil (figure 22AD), contacting said secondary lower pole at a second side that is opposite to said first side (figure 22AD, item P1T extends rearward to contact item P2T), and that is separated from said secondary lower pole at said first side by a second layer of non-magnetic material that is a write gap (figure 22E, item 714 which is unlabeled in figure 22AD).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide extend the secondary pole tip back to the contact region of the upper and lower poles, as taught by Santini, because this will ensure that the secondary and the primary pole layers experience flux transition from

the upper pole, thus yielding the expected results of a evenly distributed flux density in the primary pole region and the secondary pole region.

Regarding claim 6, Stoev and Santini disclose the features of base claim 4, as stated in the 103 rejection above, and Stoev further discloses:

Wherein said non-magnetic layer is silicon oxide, aluminum oxide, tantalum oxide, AL, Rh, Ru, Cu, NiCu or Ta (column 9, lines 5-9).

6. Claims 5, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stoev et al and Santini, as applied to claim4 above, and further in view of Sasaki et al (US Publication Number 2003/0151849).

Regarding claim 5, Stoev and Santini disclose the features of base claim 4, as stated in the 103 rejection above, but fail to specifically disclose:

Wherein said first layer of high magnetic permeability material is NiFe, CoNiFe, FeTaN, FeAlN, CoTaN, CoAlN or CoFeN and has a thickness between about 0.3 and 3 microns.

Sasaki disclose:

A magnetic write head, having an air bearing surface (ABS) (paragraph 122; figure 22, item A), comprising:

On a substrate (figure 22, item 31), a first layer of high magnetic permeability material (figure 22, item 40), having an edge whose surface is normal to said substrate

and parallel to said ABS (figure 22), that serves as a primary lower magnetic pole (paragraphs 124 & 125);

A second layer (figure 22, item 42) of high magnetic permeability that serves as a secondary lower pole (paragraphs 124 & 125) that fully covers and contacts said primary pole (figure 22);

A field coil over (figure 22, item 53), and insulated from (figure 22, items 44 & 48), said lower poles;

An upper magnetic pole (figure 22, item 56) that overlies said field coil (figure 22), contacts said lower pole at a second side that is opposite to said first side (figure 22, via item 43), and that is separated from said ledge by a second layer of non-magnetic material that is a write gap (figure 22, item 58), said upper pole having, at the write gap, a width equal to said ledge width (figure 22B), whereby it defines a track width (paragraph 136).

Wherein said first layer of high magnetic permeability material is NiFe, CoNiFe, FeTaN, FeAlN, CoTaN, CoAlN, or CoFeN and has a thickness between about 0.3 and 3 microns (paragraph 124).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to fabricating the pedestal of Stoev to this thickness, as taught by Sasaki, because this thickness helps to increase the magnetic flux density, but these materials have a relatively low saturation level, therefore, the magnetic flux density is under more strict control for accurately recording data, thus yielding the expected results.

Regarding claim 7, Stoev and Santini disclose the features of base claim 4, as stated in the 103 rejection above, but fail to specifically disclose:

Wherein said second layer of high magnetic permeability material is NiFe, CoNiFe, FeTaN, FeAlN, CoTaN, CoAlN, or CoFeN and has a thickness between about 0.2 and 2 microns.

Sasaki disclose:

Wherein said second layer of high magnetic permeability material (paragraph 125, item 42) is NiFe, CoNiFe, FeTaN, FeAlN, CoTaN, CoAlN, or CoFeN and has a thickness between about 0.2 and 2 microns (page 9, paragraph 125).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to fabricate the second layer of Stoev to have a general thickness relatively near that of the first layer, as taught by Sasaki, because this is using a known means for providing for better interaction between the two layers for yielding the expected result of allowing for a more accurate and precise control of the magnetic flux density.

Regarding claim 8, Stoev and Santini disclose the features of base claim 4, as stated in the 103 rejection above, but fail to specifically disclose:

Wherein said upper magnetic pole is NiFe, CoNiFe, FeTaN, FeAlN, CoTaN, CoAlN, or CoFeN and has a thickness between about 0.3 and 3 microns.

Sasaki disclose:

Wherein said upper magnetic pole is NiFe, CoNiFe, FeTaN, FeAlN, CoTaN, CoAlN, or CoFeN and has a thickness between about 0.3 and 3 microns (page 11, paragraph 136).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to fabricating the pedestal of Stoev from this material with this thickness, as taught by Sasaki, because this thickness helps to increase the magnetic flux density, but these materials have a relatively low saturation level, therefore, the magnetic flux density is under more strict control for accurately recording data, thus providing the expected results.

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stoev et al and Santini, as applied to claim 4 above, and further in view of Komuro et al (US Patent Number 6530141).

Regarding claim 9, Stoev and Santini disclose the features of base claim 4, as stated in the 103 rejection above, but fail to specifically disclose:

Wherein said track width is between about 0.05 and 1 micron.

Komuro discloses:

A magnetic write head, having an air bearing surface (ABS), comprising:

On a substrate (figure 16A, item 136), a first layer of high magnetic permeability material (figure 15, item 15), having an edge whose surface is normal to said substrate and parallel to said ABS (inherent), that serves as a primary lower magnetic pole (column 13, lines 1-32);

A second layer (figure 15, item 18) of high magnetic permeability that serves as a secondary lower pole (column 12, lines 58-63) that fully covers and contacts said primary pole (figure 15), above which it serves as a ledge having a width (column 6, lines 1-3);

A field coil over (figure 15, item 13), and insulated from (figure 15, items 12 & 14), said lower poles;

An upper magnetic pole (figure 15, item 11) that overlies said field coil (figure 15), contacts said lower pole at a second side that is opposite to said first side (figure 16A, via items 140-142), and that is separated from said ledge by a second layer of non-magnetic material that is a write gap (figure 15, item 17), said upper pole having, at the write gap, a width equal to said ledge width, whereby it defines a track width (column 6, lines 1-3).

Said ledge extending away from said primary pole by an amount (figure 15);

Wherein said track width is between about 0.05 and 1 micron (column 6, lines 1-3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the head of Stoev with a track width as given above, as taught by Komuro, because this is a matter of design choice for providing a large recording density.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stoev et al and Santini, as applied to claim 4 above, and further in view of Takano et al (US Patent Number 5850326).

Regarding claim 10, Stoev and Santini disclose the features of base claim 4, as stated in the 103 rejection above, but fails to specifically disclose:

Wherein said amount that said ledges extend away from said poles is between about 0.1 and 1 micron.

Takano discloses:

A magnetic write head, having an air bearing surface (ABS), comprising:

A first layer of high magnetic permeability material (figure 14, item 10b), having an edge whose surface is normal to said substrate and parallel to said ABS (figure 14; inherent), that serves as a primary lower magnetic pole (column 10, line 16);

A field coil over (figure 14, item 21), and insulated from said lower poles (column 11, lines 14-24);

An upper magnetic pole (figure 14, item 10a) that overlies said field coil (figure 14), contacts said lower pole at a second side that is opposite to said first side (figure 12b), and that is separated from said ledge by a second layer of non-magnetic material that is a write gap (figure 14, item g1);

Wherein said amount that said ledges extend away from said poles is between about 0.1 and 1 micron (figure 14, column 11, lines 39-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the ledge of Stoev extend from the poles

between about .1 and 1 micron, as taught by Takano, because this allows for accurately use focused ion beaming, which will make the recording of the signal stronger and more accurate, as stated by Takano in column 11, lines 47-49.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW G. KAYRISH whose telephone number is (571)272-4220. The examiner can normally be reached on 8am - 5pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrea Wellington can be reached on 571-272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov.

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